

**Abstract of the Disclosure**

A compression ignition engine (20) has a control system (26) for processing data, one or more combustion chambers (22), and fuel injectors (24) for injecting fuel into the combustion chambers. The control system controls fueling using a result of the processing of certain data, such as engine speed and engine load, to select one of two fueling modes (HCCI, HCCI-CD) for operating the engine. When the result of the processing selects the HCCI mode, the engine is fueled to cause homogeneous-charge compression-ignition (HCCI) combustion within the combustion chambers. When the result of the processing selects the HCCI-CD mode, the engine is fueled to create a substantially homogeneous combustible charge within each combustion chamber that is compressed to auto-ignition, and after auto-ignition, more fuel is injected to provide additional combustion in the manner of the conventional diesel combustion.